

Serial No.: 10/560,440  
Response dated 07 March 2007  
Reply to Office Action of 12 October 2006

### REMARKS

As noted previously, Applicant appreciates the Examiner's thorough examination of the subject application.

Claims 1-22 were previously pending in the subject application. Claims 1, 7, and 13 are amended herein. New claims 23-27 are presented by the present amendment to the claims. No new matter has been added.

In the Office Action mailed 28 November 2006, claims 1-18 were rejected on various grounds, as described in further detail below. Applicant requests reconsideration and further examination of the subject application in view of the foregoing amendments and the following remarks.

#### ***Claim Rejections – 35 U.S.C. § 102***

Concerning items 1-2 of the Office Action, claims 1, 7, 13, and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,305,233 to Kawagoe et al. ("Kawagoe"). Applicant respectfully traverses the rejection for the following reasons.

For a rejection under 35 U.S.C. § 102(b) to be proper, a single reference must teach, explicitly or inherently, all of the limitations as arranged in the claim(s) at issue. In this case, Kawagoe fails to teach (or make obvious) all of the elements independent claims 1, 7, 13, and 21, as amended. Thus, as explained in further detail as follows, the rejection is without proper basis and should be withdrawn.

Amended independent claim 1, representative of the independent claims under rejection, recites the following:

1. A method of correcting one or more reflectance values when a center wavelength of one or more light sources used to generate corresponding light signals is different from a specified center

Serial No.: 10/560,440  
Response dated 07 March 2007  
Reply to Office Action of 12 October 2006

wavelength for the one or more light sources, the method comprising the steps of:

- A. defining, for each of the one or more light sources, a reference spectral distribution  $\{L^*\}$  that is characteristic of the one or more light sources and composed of reference light intensity values over a set of reference wavelengths;
- B. defining, for each of the one or more light sources, a spectral distribution  $\{L\}$  comprising actual light intensity values over the set of wavelengths;
- C. determining the actual reflectance  $R$  of a set of reflected signals;
- D. defining a set of detector sensitivity data  $\{D\}$  corresponding to the set of detectors receiving the set of reflected signals;
- E. determining high resolution reflectance values  $\{r\}$ ;
- F. determining a correction factor as a function of  $\{L\}$ ,  $\{L^*\}$ ,  $\{r\}$  and  $\{D\}$ ; and
- G. applying the correction factor to  $R$  to determine  $R^*$ .

[Emphasis added]

In contrast, Kawagoe is directed to a spectrophotometer that utilizes a band-pass filter array for splitting incident light into a plurality of light components of different wavelengths, a plurality of silicon photodiodes for receiving the respective light components, and a memory for storing spectral sensitivity information. See, e.g., Kawagoe, col. 3, lines 36-43.

In making the rejection, the Examiner characterized Kawagoe as, *inter alia*, teaching:

determining high resolution reflectance values (see e.g. col 24, lines 1-3); determining a correction factor as a function of [sic] (see e.g. col 15, lines 28-43); and applying the correction factor  $R$  to determine  $R^*$  (see e.g. col. 18, lines 17-45).

Applicant respectfully traverses the Examiner's statement, as Kawagoe in general, and the

Serial No.: 10/560,440  
Response dated 07 March 2007  
Reply to Office Action of 12 October 2006

cited portions in particular, fail to teach or suggest determining high resolution reflectance values and only refer to a correction factor used to remove a measured value,  $OF(i)$ , of dark offset. As Kawagoe explains: " $OF(i)$  is a value which contains influences of an offset of the operational amplifier, external light, dark current of the silicon photodiodes, leakage current of the analog switches, etc."

The correction factor recited by Applicant's claims is "a function of  $\{L\}$ ,  $\{L^*\}$ ,  $\{r\}$  and  $\{D\}$ ," where  $\{r\}$  is disclosed by the subject application as a defined high resolution reference spectrum array derived from constant IR reflectance values  $r_{IR}$ , "where each value of  $r$  in array  $\{r\}$  equals the corresponding value of  $(R/R_{IR})r_{IR}$ ." See, e.g., specification, paragraph [0052].

Kawagoe in contrast does not teach or suggest use of a high resolution reference spectrum array  $\{r\}$ ; furthermore, as is described in further detail in Applicant's following traverse of the rejection of claims under 35 U.S.C. § 103, Kawagoe actually teaches away from such a limitation.

Consequently, Kawagoe fails to teach (or suggest) at the very least "determining high resolution reflectance values  $\{r\}$ ," "determining a correction factor as a function of  $\{L\}$ ,  $\{L^*\}$ ,  $\{r\}$  and  $\{D\}$ ," and "applying the correction factor to  $R$  to determine  $R^*$ ," e.g., as recited in amended claim 1, the Examiner's assertion to the contrary notwithstanding.

Thus, Kawagoe fails to teach (or suggest) all of the limitations as arranged in claims 1, 7, 13, and 21, and the reference is therefore an improper basis for a rejection of the claims under 35 U.S.C. § 102(b). Applicant requests that the rejection of claims 1, 7, 13, and 21 be withdrawn accordingly.

### ***Claim Rejections – 35 U.S.C. § 103***

#### ***Claims 2, 8, and 14***

Concerning items 3-4 of the Office Action, claims 2, 8, and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kawagoe in view of *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Applicant respectfully traverses the rejection and requests reconsideration

Serial No.: 10/560,440  
Response dated 07 March 2007  
Reply to Office Action of 12 October 2006

for the following reasons.

For a rejection under 35 U.S.C. §103(a) to be proper, the cited reference(s) must teach suggest all of the limitations as arranged in the claim(s) at issue. In this situation, Kawagoe fails to teach or suggest all of the limitations of claims 2, 8, and 14, even in light of the holdings of *In re Aller*, as described *infra*.

As described for the claim rejections under 35 U.S.C. § 102(b), Kawagoe fails to teach or suggest each and every element of independent claims 1, 7, and 13, which are the base claims for claims 2, 8, and 14, respectively.

For the rejection of claim 2, 8, and 14 under 35 U.S.C. § 103(a), the Examiner stated:

With respect to claims 2, 8, and 14, Kawagoe et al. disclose the invention as claimed except for teaching the correction factor is valid up to a range of at least about +/- 8 nm around the specified center wavelength. However, Kawagoe et al. disclose the correction of scattering of the wavelength pitch to nm (see e.g. col. 18, lines 54-57).

Therefore, , [sic] it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the correction factor as taught by Kawagoe because *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 [sic] the claimed ranges and prior ranges do not overlap but are close enough that one skilled in the art would have expected. There was no evidence of the critically different +/- 2 nm between the claimed ranges and the prior art ranges.

Applicant respectfully traverses this rationale, as the reference in Kawagoe to "correction of scattering of the wavelength pitch to 10 nm" (Kawagoe, col. 18, lines 54-55) is in the context of linear interpolation used for "spectral sensors", e.g., S1 and S2, of the Kawagoe spectrophotometer. Specifically, Kawagoe teaches:

[T]he program proceeds to step #48 to star calculation of wavelength correction. First of all, it will be described what the calculation of wavelength means. In the spectral sensors S1 and S2 of this embodiment, the

Serial No.: 10/560,440  
Response dated 07 March 2007  
Reply to Office Action of 12 October 2006

bandpass filter arrays are used. Peak wavelengths of the bandpass filters are at intervals of about 10 nm, though there exists a little variation in the pitch of the wavelengths. Correction of scattering of the wavelength pitch is carried out by the linear interpolation method. This is what the calculation of wavelength correction means.

Thus, Kawagoe fails to teach or suggest determining a correction factor within a range of at least about  $\pm 8$  nanometers around the specified center wavelength, as recited in Applicant's claims.

In addition to not teaching or suggesting each and every element of Applicant's claims, Kawagoe actually teaches away from any use of IR reflectance values as was stated for the rejection under 35 U.S.C. § 102. One skilled in the art would appreciate that Kawagoe is directed to spectrophotometers utilizing xenon flash lamps as light sources, and that the spectral output of such lamps lies almost exclusively in the range between 400 nm and 700 nm. Along with the use of a xenon lamp as a light source, Kawagoe teaches that its band pass filters, through which all spectral data is filtered, are configured to virtually eliminate all detection in the infrared region of the spectrum:

The band-pass filter arrays F1, F2 of the spectral sensors have been treated so that they may cut off the infrared and ultraviolet rays. So, each of the spectral sensitivities  $S0(\lambda)$  through  $S39(\lambda)$  is almost zero in the wavelength range shorter than 370 nm and longer than 720 nm.

(Kawagoe, col. 15, lines 54-59) [Emphasis added]

Thus, one skilled in the art would understand Kawagoe as teaching away from the use of band-pass filters allowing detection of infrared light, and for that matter the use of photodetectors detecting infrared light; consequently, Kawagoe teaches away from any use of measured reflectance in the infrared range, i.e., one of the components of {r} recited in Applicants' claims.

For the foregoing reasons, Applicant respectfully submits that Kawagoe is an improper basis for a rejection of claim 2, 8, and 14 under 35 U.S.C. § 103(a), and the Applicant requests that the rejection be withdrawn accordingly.

Serial No.: 10/560,440  
Response dated 07 March 2007  
Reply to Office Action of 12 October 2006

Claims 3-6, 9-12, 15-20, and 22

Claims 3-6, 9-12, 15-20, and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kawagoe, cited previously, further in view of U.S. Patent No. 5,305,233 to Williams et al. ("Williams"). Applicant respectfully traverses the rejection and requests reconsideration for the following reasons.

As noted previously, Kawagoe is deficient relative to the limitations of Applicant's independent claims 1, 7, 13, and 21. Independent 19 contains similar limitations, which are likewise not taught or suggested by Kawagoe.

In contrast with Applicant's claims, Williams is directed to a dual-wavelength low-power built-in-test for a laser-initiated ordnance system. For such a test and related apparatus, Williams specifically teaches:

According to the present invention, the optical continuity of a fiber optic conduit normally terminated by, and in optical continuity with, an element having a wavelength-dependent reflectivity is tested by coupling light of a first wavelength band to the fiber optic conduit, detecting light in the first wavelength band reflected through the fiber optic conduit, coupling light of a second wavelength band to the fiber optic conduit, and detecting light in the second wavelength band reflected through the fiber optic conduit. A relative comparison is formed of light in the first wavelength band reflected through the fiber optic conduit and light in the second wavelength band reflected through the fiber optic conduit. If optical continuity exists between the fiber optic conduit and the element having a wavelength-dependent reflectivity, more light will be reflected in one of the wavelength bands than the other. Reliable continuity testing of the fiber optic conduit including in-line connectors is thereby made possible, by detecting the characteristic relative difference of the reflected light energies of the different wavelengths of the different wavelengths.

(Williams, col. 2, lines 31-42) [Emphasis added]

Williams is cited by the Examiner as teaching use of LEDs as multiple light sources. Without acceding to the existence of proper motivation to combine the references, Williams is not

Serial No.: 10/560,440  
Response dated 07 March 2007  
Reply to Office Action of 12 October 2006

understood as curing the deficiencies noted above for Kawagoe relative to Applicant's, independent claims 1, 7, 13, 19, and 21, from which the remaining claims subject to the rejection depend.

Thus, the combination of the teachings of Kawagoe and Williams fails to teach or suggest all the limitations of claims 3-6, 9-12, 15-20, and 22, and is therefore an improper basis for a rejection of those claims under 35 U.S.C. § 103(a). Applicant respectfully requests that the rejection of claims 3-6, 9-12, 15-20, and 22 be withdrawn accordingly.

### **Conclusion**

For the foregoing reasons, Applicant submits that all of the claims now pending in the subject application are in condition for allowance. New claims 23-27 depend from claims already pending in the application and are believed to likewise be patentable. Accordingly, Applicants requests that a Notice of Allowance be issued for the subject application.


If a telephone conference will expedite prosecution of the application, the Examiner is invited to telephone the undersigned.

Authorization is hereby given to charge our deposit account no. 50-1133, for any fees that may be required for the prosecution of the subject application.

Respectfully submitted,

Mc DERMOTT WILL & EMERY LLP

Date: 07 March 2007

  
Toby H. Kusmer, P.C., Reg. No. 26,418  
G. Matthew McCloskey, Reg. No. 47,025  
Attorneys for Applicants  
28 State Street  
Boston, MA 02109-1775  
Telephone: (617) 535-4000  
Facsimile: (617) 535-3800